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#### REMARKS

Applicants acknowledge receipt of the Office Action dated May 18, 2006, in which:

- Claims 1-10, 14, 16-21, 40-41, 45-49, 76-77 and 80-81 are rejected under 35 U.S.C. §102(b) as
   being unpatentable over U.S. Patent 4,906,176 (hereinafter Yamashita);
- Claims 1, 3-7, 9-11, 13-17, 19-25, 40-49 are rejected under 35 U.S.C. §102(b) as being unpatentable over U.S. Patent 6,015,285 (hereinafter McCarty);
- Claims 11, 13, 15, 22-25, 42-44 are rejected under 35 U.S.C. §103(a) as being unpatentable over Yamashita in view of McCarty; and
- Claim 12 is rejected under 35 U.S.C. §103(a) as being unpatentable over Yamashita in view of
   McCarty and further in view of U.S. Patent 4,793,797 (hereinafter Kato).

Moreover, Claims 26-39, 50-75, 78-79, 82 stand withdrawn from examination as non-elected claims from a restriction requirement dated January 25, 2006.

Applicants thank the Examiner for the care and diligence with which the Examiner has examined the pending claims. Applicants have amended some of the claims, and respectfully traverse each of these rejections for the following reasons.

## L Status of the Claims

In this response, Claims 10, 14, 15, 36, 41, 56, 59, 75, 82 are canceled; elected Claims 1-9, 11-13, 16, 19, 20, 23, 24, 40, 42, 46, 47, 49, 76, 77, 80, 81 are amended; withdrawn Claims 26, 30, 33, 34, 37, 38, 39, 50-51, 53, 55, 57, 58, 60, 61, 66, 78, 79 are amended; and Claims 83-90 are newly added claims.

It should be noted that the terminology "rare-earth" was replaced with "rare earth" throughout the claims whenever appropriate. These terms are interchangeable, but for consistency sake, Applicants believe that the uniform use of only one term "rare earth" in the claims seems to be more proper.

As a result, Claims 1-9, 11-13, 16-35, 37-40, 42-55, 57, 58, 60-74, 76-81 & 83-90 are currently pending in the case, in which

- independent Claim 1 and its dependent Claims 2-9, 11-13, 16-25, 76 & 77 covering a catalyst support are under examination;
- independent Claim 40 and its dependent Claims 42-49, 80, 81 & 83-85 covering a partial oxidation catalyst are under examination;

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- independent Claim 86 and its dependent Claims 87-90 covering a partial oxidation catalyst are newly added and are requested to be examined with the present elected invention of Group I;
- independent Claim 26 and its dependent Claims 27-35 and 37-39 covering a method of making a support stand withdrawn from examination as non-elected claims; and
- independent Claim 50 and its dependent Claims 51-55, 57-58, 60-74 and 78-79 covering a
  process of making synthesis gas using a catalyst stand withdrawn from examination as nonelected claims.

# II. Rejection under 35 U.S.C. § 102(b) over Yamashita

Claims 1-10, 14, 16-21, 40-41, 45-49, 76-77 and 80-81 were rejected under 35 U.S.C. §102(b) over *Yamashita*. By this reply Claims 10, 14, 41 were canceled, so the rejection on such claims is now moot.

In view of the present amendment to the claims, Applicants respectfully traverse the Examiner's rejection as *Yamashita* does not anticipate such claims, as *Yamashita* fails to teach all of the limitations of currently-amended independent Claims 1 and 40.

## Rejection of Claim 1 and its dependent Claims 2-9, 16-21, 76-77.

In this response, Applicants amended Claim 1 to recite three distinct crystalline structures comprised in the catalyst support of Claim 1, which are:

- an alumina phase selected from the group consisting of alpha-alumina, theta-alumina and combinations thereof;
- a rare earth aluminate of a hexaaluminate or hexaaluminate-like structure comprising at least one rare-earth metal and having a high molar ratio of aluminum to rare earth metal between 11:1 and 14:1; and
- a rare earth aluminate of a perovskite or perovskite-like structure comprising the at least one rare-earth metal and having a low molar ratio of aluminum to rare earth metal of less than 2:1.

Furthermore Claim 1 was amended to further narrow the support content in alpha-alumina to not more than about 20%. Such amendments of Claim 1 is supported by the application as filed for example, by at least originally filed Claims 10, 14 and 15, and paragraphs [0019] on Page 7; [0020] on Page 8; [0046] on Page 17; and [0059] on Page 19 of the application as originally filed.

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Claims 10, 14 and 15 are now canceled, as they were incorporated into amended Claim 1.

Claims 2, 6, 7, 8, 9, 11, 12, 13, 76, 77 were amended to add "with the high molar ratio of aluminum to rare earth metal" to proper identify the correct rare earth aluminate to which these claims refer.

Claims 3, 19, and 20 were amended for consistency with the recitation "the at least one rare earth metal" which is used in Claim 1.

In view of the present amendments to Claim 1, Applicants assert that Yamashita fails to teach all of the limitations of currently-amended independent Claim 1. Yamashita discloses a high temperature stable catalyst comprising a support and a catalytically active component supported on said support, wherein at least the part of said support that predominantly supports said active component comprises a composite oxide of aluminum and at least one member selected from the group of lanthanum, neodymium, praseodymium and mixtures thereof. The composite oxide is a mixture of L-β-alumina and a precursor thereof, or substantially the precursor. The precursor is in an amorphous state or a structure resembling L-β-alumina, and is convertible to L-β-alumina when heated to an elevated temperature above 1000°C within10 hours. See Yamashita Abstract and Col 3 lines 19-32; Col. 4 lines 66 to Col 5 line 4.

However, Yamashita does not teach the combination of these three crystalline phases into a support composition as recited in current Claim 1 (for example, see Figure 4 in Yamashita failing to show such combination), and further does not teach the limited amount of alpha-alumina (not more than 20%) in the composite material. As such, Applicants assert that Yamashita does not provide every limitation of currently-amended Claim 1 and a fortiori also its dependent Claims 2-9, 16-21 and 76-77, as required for a prima facie case of anticipation (see MPEP 2131).

As for the claims 20-25 covering a product-by-process, Yamashita discloses the inconsistencies amongst the field of alumina stabilization by rare earth metals and states his belief that the inconsistencies may result from a difference in the preparation methods (see Yamashita Col. 10 lines 45-50 and lines 66-68). So, the reference itself teaches that the preparation method does have an impact whether or not lanthanum-β-alumina is formed and is present in the resulting catalyst support and whether or not its presence has an impact on the stability of the resulting catalyst support. Furthermore, Applicant has stated a similar inconsistency in this field in paragraph [0035] on Page 13 of the application as filed. Yamashita illustrates a composite material resulting from a co-

precipitation of a rare earth compound and an aluminum-containing compound, but however does not illustrate the formation of all three crystalline phases as a result of an impregnation method, as recited in Claim 20 and its dependent claims.

Thus, Yamashita does not anticipate Claim 1-9, 16-21 and 76-77, and Applicants respectfully request that the Examiner withdraw the § 102 rejection on such claims.

## Rejection of Claims 40, 45-49 and 80-81

In this Response, Applicants amended Claim 40 to recite three distinct crystalline structures in the catalyst support, which are:

- an alumina phase selected from the group consisting of alpha-alumina, theta-alumina and combinations thereof:
- a rare earth aluminate of a hexaaluminate or hexaaluminate-like structure comprising at least one rare-earth metal and having a high molar ratio of aluminum to rare earth metal between 11:1 and 14:1; and
- a rare earth aluminate of a perovskite or perovskite-like structure comprising the at least one rare-earth metal and having a low molar ratio of aluminum to rare earth metal of less than 2:1.

Such amendment of Claim 40 is supported by the application as filed for example, by at least originally filed Claims 14, 15, 41 (now canceled), and paragraphs [0019] on Page 7; [0020] on Page 8; and [0046] on Page 17 and [067] on Page 22 of the application as originally filed.

Furthermore, Claim 40 was amended to further narrow the active ingredient composition by reciting: "an active ingredient comprising a rhodium alloy or a metal selected from the group consisting of rhodium, iridium, ruthenium and combinations thereof, said rhodium being in an amount of from about 0.1 wt% to about 20 wt% based on the total catalyst weight". Such amendment of Claim 40 is supported by the application as filed, for example by at least the Abstract and paragraphs [068]-[070] on Page 23 of the application as originally filed.

Claims 47, 49, 80, 81 were amended to add "with the high molar ratio of aluminum to rare earth metal" to proper identify the correct rare earth aluminate to which these claims refer.

As stated earlier, Yamashita fails to disclose the combination of these three crystalline phases in a catalyst support, but Yamashita also fails to disclose the active ingredient in the high-temperature stable catalyst as well as the rhodium loading as recited in currently-amended Claim 40.

Thus, Applicants contend that Yamashita fails to teach every limitation of currently-amended Claim 40, and a fortiori also fails to teach all of the limitations of the rejected dependent Claims 45-49 and 80-81, for each dependent claim contains all of the limitations of such independent claim to which they ultimately refer.

As such, Applicants contend that *Yamashita* does not anticipate Claims 40, 45-49 and 80-81, and respectfully request that the Examiner withdraw the § 102 rejection on such claims.

## III. Rejection under 35 U.S.C. § 102(b) over McCarty

In the Office Action mailed on May 18, 2006, Claims 1, 3-7, 9-11, 13-17, 19-25, 40-49 were rejected under 35 U.S.C. § 102(b) as being unpatentable over *McCarty*.

Applicants respectfully traverse the Examiner's rejection as *McCarty* fails to teach all of the limitations of currently-amended independent Claims 1 and 40 and *a fortiori* of their respective rejected dependent claims.

# Rejection of Claim 1 and its dependent Claims 3-7, 9-11, 13-17, 19-25

In this Response, Claims 10, 14 and 15 were canceled so their rejection is now moot.

As stated earlier, Claim 1 in its amended form requires the presence in three distinct crystalline phases: an  $(\alpha \text{ and/or } \theta)$  alumina phase; a rare earth aluminate of a hexaaluminate or -like structure; and a rare earth aluminate of a perovskite or -like structure in the catalyst support. Claim 1 further requires that both aluminates comprises the same rare earth metal; and that the support contains not more than 20 percent of alpha-alumina.

McCarty describes a catalyst structure in which a diffusion barrier layer is applied to the catalyst layer that is coating a carrier material in order to specifically reduce the catalytic effect of the catalyst. This measure also is intended to prevent overheating of the catalyst structure, in particular overheating generated when the catalytic reaction is sufficient to initiate a homogeneous gas phase reaction within the catalyst structure. However, McCarty does not teach such combinations of elements.

Applicants contend that *McCarty* fails to teach all of the limitations of currently-amended Claim 1 for the reasons stated above, and *a fortiori* also of the rejected dependent Claims 3-7, 9, 11, 13, 16-17, 19-25. Thus, Applicants believe that *McCarty* does not anticipate Claims 1, 3-7, 9, 11, 13,

16-17, 19-25, and respectfully request that the Examiner withdraw the § 102 rejection on such claims.

# Rejection of Claim 40 and its dependent Claims 41-49

By this response, Claim 41 is canceled, so its rejection is now moot.

As stated earlier, McCarty fails to teach the catalyst support composition in amended Claim 40. Furthermore, Claim 40, in its amended form, now recites an active ingredient which comprises "a rhodium alloy or a metal selected from the group consisting of rhodium, iridium, ruthenium and combinations thereof, said rhodium being in an amount of from about 0.1 wt% to about 20 wt% based on the total catalyst weight". McCarty also fails to disclose iridium, ruthenium, and a specific range of rhodium loading.

For at least this reason stated above, *McCarty* does not teach every limitation of currently-amended Claim 40, and *a fortiori* also of the rejected dependent Claims 42-49, for each dependent claim contains all of the limitations of such independent claim to which they ultimately refer.

Thus, Applicants believe that *McCarty* does not anticipate Claims 40 & 42-49, and respectfully request that the Examiner withdraw the § 102 rejection on such claims.

# IV. Rejection Under 35 U.S.C. § 103(a) over Yamashita in view of McCarty

Claims 11, 13, 15, 22-25 and 42-44 were rejected under 35 U.S.C. § 103(a) over *Yamashita* in view of *McCarty*. In this response, Claim 15 was cancelled, and consequently, such rejection now becomes moot.

Applicants respectfully traverse the Examiner's rejection as the combination of Yamashita with McCarty fails to teach all of the limitations of Claims 11, 13, 22-25 and 42-44.

With respect to Claims 11, 13 & 22-25, as stated above, both Yamashita and McCarty fail as primary references for not teaching or suggesting all the limitations of Claim 1 from which rejected Claims 11, 13 & 22-25 depend. For example, both references fail to teach a maximum alpha-alumina content range (not more than 20%) in the support. Notwithstanding the Examiner's assessment that Yamashita fails to disclose the elements in such claims, Applicants contend that McCarty still does not remedy to the deficiencies of Yamashita's disclosure in terms of the alpha-alumina content, as recited in Claim 1 from which these claims 11, 13 & 22-25 depend.

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With respect to Claims 42-44, as stated above, both Yamashita and McCarty fail as primary references for not teaching or suggesting all the limitations of Claim 40 from which rejected Claims 42-44 depend. For example, both references fail to teach the active ingredient composition and the range in rhodium content in the catalyst. Notwithstanding the Examiner's assessment that Yamashita fails to disclose the elements in Claims 42-44, Applicants contend that McCarty still does not remedy to the deficiencies of Yamashita's disclosure in terms of such active ingredient composition limitation as recited in Claim 40 from which these claims 42-44 depend.

Thus, Applicants believe that the combination of Yamashita with McCarty fails to teach all of the elements of Claims 11, 13, 22-25 & 42-44 as required by MPEP 2143.03 for obviousness.

"...To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)..."- MPEP 2143.03.

For at least the above stated reason, Applicants submit that a *prima facie* case of obviousness was not properly set forth for Claims 11, 13, 22-25 & 42-44, and respectfully request the withdrawal of the 103(a) rejection on such claims.

# V. Rejection Under 35 U.S.C. § 103(a) over Yamashita in view of McCarty and further in view of Kato

Claim 12 was rejected under 35 U.S.C. § 103(a) over Yamashita in view of McCarty and further in view of Kato. Applicants respectfully traverse the rejection and submit that, contrary to MPEP section §2143, the Examiner has failed to make a prima facie case of obviousness in rejecting such claim. As required by MPEP 2143.03 for obviousness, the combination of these three references fails to teach all of the elements of Claim 12. Thus, Applicants respectfully request the Examiner to withdraw the 103 rejection of such claim for lack of prima facie.

## VL New Claims

Applicant added new Claims 83-90 to add embodiments to the elected invention to which Applicant is entitled. Applicant believes that such new claims are supported by the Application as filed and do not constitute new matter. Applicant respectfully requests the Examiner to

consider these new claims as part of the elected invention of Group I as identified in the Restriction Requirement dated January 25, 2006.

Claims 83-85 depend from Claim 40 and are supported as follows (all cited paragraph numbers originate from the specification as filed):

- Claim 83 is supported by at least paragraph [0059] on Page 19 of the specification as filed;
- Claim 84 is supported by at least paragraph [0069] on Page 23 of the specification as filed; and
- Claim 85 is supported by at least paragraph [0070] on Page 23 of the specification as filed.

Claims 86 is a new independent claim from which new Claims 87-90 depend. Claim 86 covers a partial oxidation catalyst composition which is narrower in scope than current Claim 40 in that the active ingredient comprises rhodium or a rhodium alloy.

Claims 86-90 are supported as follows (all cited paragraph numbers originate from the specification as filed):

- Claim 86 is supported by at least originally filed Claims 40, 41 and paragraphs [0046] on Page 17 and [0068]-[0070] on Page 23 of the specification as filed;
- Claim 87 is supported by at least paragraph [0039] on Page 15 of the specification as filed;
- Claim 88 is supported by at least paragraph [0025] on Page 10 of the specification as filed;
- Claim 89 is supported by at least paragraph [0070] on Page 23 of the specification as filed; and
- Claim 90 is supported by at least originally filed Claim 69 and paragraph [0072] on Pages 23-24
  of the specification as filed.

## VII. Withdrawn process Claims of non-elected Group II

Claims 26-39 and 78-79 covering a method of making a catalyst support were withdrawn as non-elected claims of Group II, as identified in the Restriction Requirement dated January 25, 2006. By this amendment, Claim 36 is canceled. Withdrawn Claims 26-35, 37-39 and 78-79 represent non-elected Group II and are currently pending in the application.

In this reply, based on MPEP §821.04(b), Applicant amended the withdrawn independent Claim 26 covering a method of making a catalyst support to narrow the resulting catalyst support composition

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to carry all of the limitations pertaining to the catalyst support composition of currently-amended Claim 1 which Applicant believes is allowable.

"Where the application as originally filed discloses the product and the process for making and/or using the product, and only claims directed to the product are presented for examination, applicant may present claims directed to the process of making and/or using the allowable product by way of amendment pursuant to 37 CFR 1.121. In view of the rejoinder procedure, and in order to expedite prosecution, applicants are encouraged to present such process claims, preferably as dependent claims, in the application at an early stage of prosecution. Process claims which depend from or otherwise require all the limitations of the patentable product will be entered as a matter of right if the amendment is presented prior to final rejection or allowance, whichever is earlier."- See MPEP §821.04(b)

Applicant further amended withdrawn Claim 26 by incorporating the limitation in temperature range from Claim 30. Claim 30 in turn is amended to narrow the temperature range to "between about 1,200°C and about 1,300°C". This range of temperature is supported by at least paragraph [0102] on Page 31 of the specification as filed.

Claims 34, 37, 38, 39 were amended to improve claim form and/or language, and these amendments do not alter the scope of these claims.

Applicant further amended withdrawn Claim 29 by removing the word "mostly" to clarify the claim language and to prevent any possible issue under 35 U.S.C. § 112.

Claim 33 was amended to require that both of the two rare earth aluminates comprise lanthanum.

Based on the rejoinder practice set forth in MPEP § 821.04 (identified on Pages 3-4 in the Office Action dated January 25, 2006), Applicant seeks the rejoinder of withdrawn non-elected Claim 26 and its dependent Claims 27-35, 37-39 and 78-79, since withdrawn Claim 26, as currently-amended, recites all of the same catalyst limitations as currently-amended catalyst Claim 1 which Applicant believes is allowable.

"... if applicant elects a claim(s) directed to a product which is subsequently found allowable, withdrawn process claims which depend from or otherwise require all the limitations of an allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must depend from or otherwise require all the limitations of an allowable product claim for that process invention to be rejoined. Upon rejoinder of claims directed to a

previously nonelected process invention, the restriction requirement between the elected product and rejoined process(es) will be withdrawn." - See MPEP §821.04(b)

## VIII. Withdrawn method Claims of non-elected Group III

Claims 50-75 and 82 covering a method for making synthesis gas using a catalyst were withdrawn as non-elected claims of Group III, as identified in the Restriction Requirement dated January 25, 2006. By this amendment, Claims 56, 59 and 75 are canceled. Thus, withdrawn Claims 50-55, 57, 58 and 60-74 represent non-elected Group III and are currently pending in the application.

In this reply, based on MPEP §821.04(b), Applicant amended the withdrawn independent process Claim 50 to narrow the catalyst composition in order for withdrawn Claim 50, as currently-amended, to carry all of the limitations pertaining to the catalyst composition of currently-amended Claim 40 which Applicant believes is allowable.

Claims 51, 53, 55, 57, 58, 60 and 61 were amended to improve claim form and/or language, and these amendments do not alter the scope of these claims.

Applicants amended Claim 58 by replacing "at least partially" with "partially or completely", a and such amendment is supported by at least paragraph [0047] on Page 17 of the application as originally filed.

Applicant further amended withdrawn Claim 66 by removing the word "mainly" to clarify the claim language and to prevent any possible issue under 35 U.S.C. § 112. Applicant further amended Claim 66 by adding a methane content of "at least about 50% by volume of methane" in the hydrocarbon stream, and such amendment is supported by at least paragraph [0114] on Page 53 of the application as originally filed.

Based on the rejoinder practice set forth in MPEP § 821.04 as stated above, Applicant seeks the rejoinder of withdrawn non-elected Claim 50 and its dependent Claims 51-55, 57, 58 and 60-74, since withdrawn Claim 50, as currently-amended, recites all of the same catalyst limitations as currently-amended catalyst Claim 40 which Applicant believes is allowable.

# IX. Conclusion

In conclusion, Applicants submit that a prima facie case of anticipation was not properly set forth for Claims 1-11, 13-25, 40-49, 76-77 & 80-81, since neither Yamashita nor McCarty fails to

teach all of the elements of independent Claims 1 and 40, and a fortiori of their pending dependent claims. Moreover, prima facie cases of obviousness based on the combination of Yamashita with McCarty for dependent Claims 11, 13, 15, 22-25 & 42-44 and based on the combination of Yamashita with McCarty and further in view of Kato for Claim 12 were not properly set forth. As such, Applicants believe that all pending claims are patentable over the art of record.

Based on MPEP §821.04, Applicant respectfully requests the rejoinder of withdrawn non-elected Claims 26 and 50 and their respective pending dependent Claims 27-35, 37-39 & 78-79 and 51-55, 57, 58 & 60-74, since withdrawn independent Claim 50, as currently-amended, recites all of the same catalyst limitations as allowable catalyst Claim 40 in its current amended form; and similarly withdrawn independent Claim 26, as currently-amended, recites all of the same catalyst limitations as allowable catalyst support Claim 1 in its current amended form. Furthermore, Applicant believes that withdrawn Claims 26-35, 37-39, 50-55, 57, 58, 60-74 & 78-79 are allowable over the art of record and are free from 35 U.S.C. §101 or §112, first paragraph issues.

Allowance of all pending claims is respectfully solicited.

Applicant further believes that the cancellation of nine claims (i.e., Claims 10, 14, 15, 36, 41, 56, 59, 75, 82) in this Response is sufficient to cover the addition of eight new claims (i.e. Claims 83-90) so that no additional claim fee is required.

In this Response, Applicants may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the prior art, which have yet to be raised, but which may be raised in the future. No new matter is introduced by this Response.

This is believed to be a full and complete response to the Office Action of May 18, 2006, as Applicants believe they have addressed the issues raised in the Office Action. Should Applicants not have properly understood the Office Action to which this Response is filed, or there is any remaining issue which the Examiner believes would possibly be resolved by a conversation, the Examiner is invited to call the undersigned at (281) 293-4751 so that further delay in a Notice of Allowance can be avoided.

Concurrently filed herewith, Applicants are submitting a petition for a one-month extension of time under 37 CFR 1.136(a) accompanied by the authorization of charge in the amount of \$120 fee to Deposit Account Number, 16-1575 of ConocoPhillips Company, Houston, Texas, in order for this response to be timely filed.

Should any fees have been inadvertently omitted, or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to the above-referenced Deposit Account Number, and consider this a petition for any additional necessary extension of time.

Respectfully submitted,

CONOCOPHILLIPS COMPANY
IP LEGAL

Date: September 18, 2006

By Beatrice C. Ortego USPTO Reg. No. 54,350 Agent for Applicant

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